**DEPARTMENT OF TRANSPORTATION**
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

Bay Area Branch
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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 1.28

# WELDING INSPECTION REPORT

**Resident Engineer:** Casey, William
**Address:** 333 Burma Road
**City:** Oakland, CA 94607

**Report No:** WIR-026879
**Date Inspected:** 13-Dec-2011

**Project Name:** SAS Superstructure
**Prime Contractor:** American Bridge/Fluor Enterprises, a JV
**Contractor:** American Bridge/Fluor Enterprises, a JV

**OSM Arrival Time:** 700
**OSM Departure Time:** 1730
**Location:** Job Site

**CWI Name:** Salvador Merino and Steve Jensen

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|---|---|---|---|---|---|---|---|
| **CWI Present:** | ☑ Yes | ☐ No | | | | | |
| **Inspected CWI report:** | ☐ Yes | ☑ No | ☐ N/A | **Rod Oven in Use:** | ☑ Yes | ☐ No | ☐ N/A |
| **Electrode to specification:** | ☑ Yes | ☐ No | ☐ N/A | **Weld Procedures Followed:** | ☑ Yes | ☐ No | ☐ N/A |
| **Qualified Welders:** | ☑ Yes | ☐ No | ☐ N/A | **Verified Joint Fit-up:** | ☐ Yes | ☐ No | ☑ N/A |
| **Approved Drawings:** | ☑ Yes | ☐ No | ☐ N/A | **Approved WPS:** | ☑ Yes | ☐ No | ☐ N/A |
| | | | | **Delayed / Cancelled:** | ☐ Yes | ☑ No | ☐ N/A |

**Bridge No:** 34-0006
**Component:** SAS OBG

**Summary of Items Observed:**

Caltrans Office of Structural Material (OSM) Quality Assurance Inspector (QAI) Joselito Lizardo was present at the Self Anchored Suspension (SAS) job site as requested to perform observations on the welding of components for the San Francisco Oakland Bay Bridge (SFOBB) Project.

At OBG 14E-PP127.2-E5 vent hole infill plate to top deck plate outside, QA randomly observed ABF/JV qualified welder Jorge Lopez perform CJP groove welding repair. The welder was observed welding in the 4G (overhead) position utilizing Shielded Metal Arc Welding (SMAW) with 1/8” diameter E7018H4R electrode implementing welding procedure ABF-WPS-D15-1004-Repair for the Seismic Performance Critical Member (SPCM) butt joint. Prior the repair excavation, the weld butt joint and adjacent base metal were preheated to more than 225 degrees Fahrenheit using propane gas torch. After the excavation and subsequent smooth grinding, ABF QC Salvador Merino was observed performing Magnetic Particle Testing (MT) on the boat shape excavation with no significant defects noted during the test. The excavation and adjacent base metal were again preheated to more than 325 degrees Fahrenheit prior welding. ABF QC Salvador Merino was noted monitoring the welder at the time of the repair with measured working current of 133 amperes on a 1/8” diameter E7018H4R electrode. The welding repair located at Y=360 having dimensions of 60mm long x 18mm wide x 7mm deep was completely welded during the shift and was Post Weld Heat Treated (PWHT) at 450 degrees Fahrenheit for one (1) hour as required using the Miller Proheat 35 Induction Heating System.

At OBG 11E-PP101-E3-#1 lifting lug hole infill plate to top deck plate inside, ABF welder Salvador Sandoval was observed continuing to perform 4G Shielded Metal Arc Welding (SMAW) welding fill pass to cover pass on the infill plate to top deck plate butt joint. The welder was noted using 1/8” diameter E7018H4R implementing

Welding Procedure Specification (WPS) ABF-WPS-D15-1110A Rev.1. During welding, ABF QC Salvador Merino was noted monitoring the welder's welding parameters with measured working current of 128 amperes on the 1/8" diameter E7018H4R electrode. The welder was noted preheating the plates to more than 150°F using propylene gas torch prior welding. During the shift, cover pass welding was completed on the bottom side of the butt joint and the welder has moved to the other lifting hole #3 of the same panel point location. The welder performed the same 4G SMAW back welding on butt joint and completed before the end of the shift including flush grinding on the weld cover. After the welding completion of the two lifting lug holes, the welder again moved to the other two lifting lug holes #2 and #4 and performed carbon arc gouging until the end of the shift.

At OBG 13E/14E side plate 'E2' (600mm long) inside, QA randomly observed ABF/JV qualified welder Jin Pei Wang continuing to perform CJP groove (splice) welding fill pass on the south end of the splice butt joint. The welder was observed perform manual welding in the 3G (vertical) position utilizing a dual shield Flux Cored Arc Welding (FCAW-G) with E71T-1M, 1/16" diameter wire electrode and implementing Caltrans approved Welding Procedure Specification (WPS) ABF-WPS-D15-3042B-1. The joint being welded has a single V-groove butt joint with backing bar that will be removed then back welded. The splice joint was preheated and maintained to greater than 150 degrees Fahrenheit using Miller Proheat 35 Induction Heating System heater blankets located at the opposite side of the plate prior/during welding. During welding, ABF Quality Control (QC) Steve Jensen was noted monitoring the welding parameters of the welder with measured working current of 224 amperes and working voltage of 23.2 volts. At the end of the shift, fill pass welding on the splice butt joint was still continuing and should remain tomorrow.

This QA performed Magnetic Particle Testing (MT) on the weld repair of the West Jacking Frame. There was no relevant indication during the test and the weld repair deemed acceptable to the contract requirements.

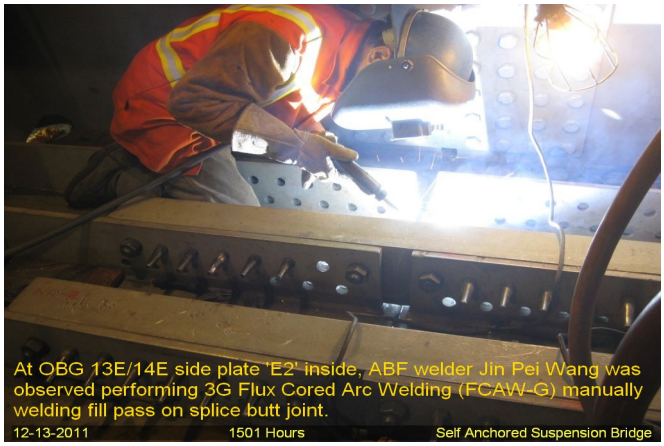
FW Spencer:

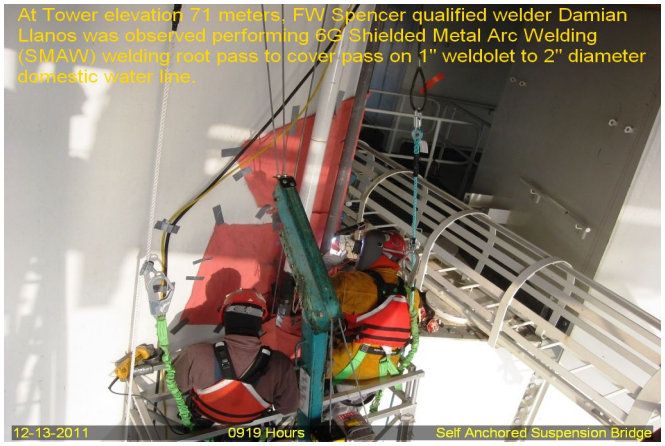
At Tower South shaft elevation 73 meters, this QA randomly observed FW Spencer qualified welder Damian Llanos ID-6645 perform Complete Joint Penetration (CJP) 6G (all position) Shielded Metal Arc Welding (SMAW) welding root pass to cover pass on the 2.0" and 3" diameter domestic water and air lines respectively. The system lines being welded are field branches of the two lines along the tower elevation. The welder was noted welding the root pass with 3/32" diameter E6010 electrode and followed by fill pass to cover pass using 3/32" diameter E7018H4R electrode implementing Caltrans approved procedure FW Spencer WPS 1-12-1. The welder was noted preheating and removing the moisture of the joint using a portable propane gas torch prior welding. During welding, ABF QC Steve Jensen was noted monitoring the parameters of the welder. At the end of the shift, the welder has completed the 1" weldolet branch to the 2" diameter domestic water line and 2" branch butt joint from a 3"x 2" reducing tee .

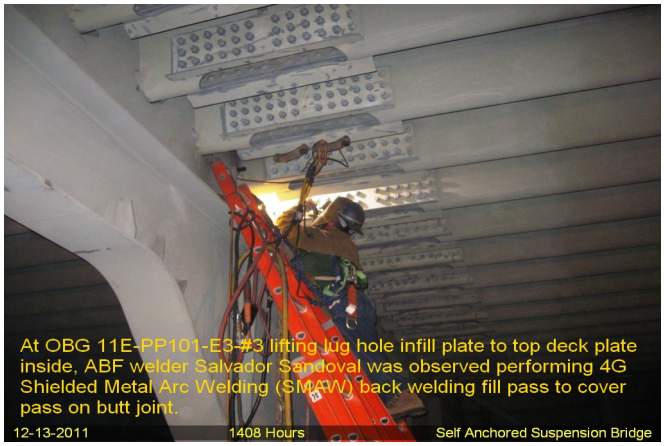
This QA together with FW Spencer foreman have performed visual test (VT) verification on all completed butt joints of the 2" and 3" domestic water and air lines from elevation 56 meters to 79 meters of the tower.
The following welded butt joints and branches were VT verified and deemed acceptable to contract requirements;

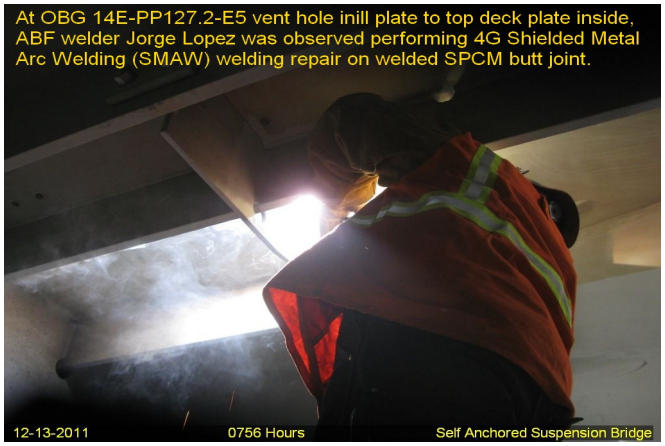
| Weld Identification | Location/elevation | Remarks |
|---|---|---|
| 1. 111130-01 | 56 meters | 3" Pipe support PS-4 |
| 2. 111130-02 | 56 | 3" Pipe support PS-4 |

3. 111208-01 56 2” Pipe support PS-4
4. 111208-02 56 2” Pipe support PS-4
5. 19/2/T/56 56 2” pipe field splice
6. 33/3/T/61 61 3” pipe field splice
7. 18/2/T/65 65 2” pipe field splice
8. 31/3/T/66 66 3” pipe field splice
9. 32/3/T/62 66 3” pipe field splice
10. 1/T2/CA2/66 66 2” branch from 3” line
11. 1/T2/DW1/66 66 1” weldolet branch from 2” line
12. 17/2/T/68 68 2” pipe field splice
13. 30/3/T/73 73 3” pipe field splice
14. 16/2/T/71 71 2” pipe field splice
15. 29/3/T/78 78 3” pipe field splice
16. 29/3/T/78 78 3” pipe field splice
17. 1/T2/CA2/79 79 2” branch from 3” line
18. 1/T2/DW1/79 79 1” weldolet branch from 2” line




**Summary of Conversations:**

No significant conversation ocurred today.

# WELDING INSPECTION REPORT

*( Continued Page 4 of 4 )*

**Comments**

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact SMR Nina Choy 510-385-5910, who represents the Office of Structural Materials for your project.

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|---|---|---|
| **Inspected By:** | Lizardo,Joselito | Quality Assurance Inspector |
| **Reviewed By:** | Levell,Bill | QA Reviewer |